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DEFOLIATING INSECTS OF WESTERN LARCH IN THE NORTHERN ROCKY MOUNTAINS 1957

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Prepared By The
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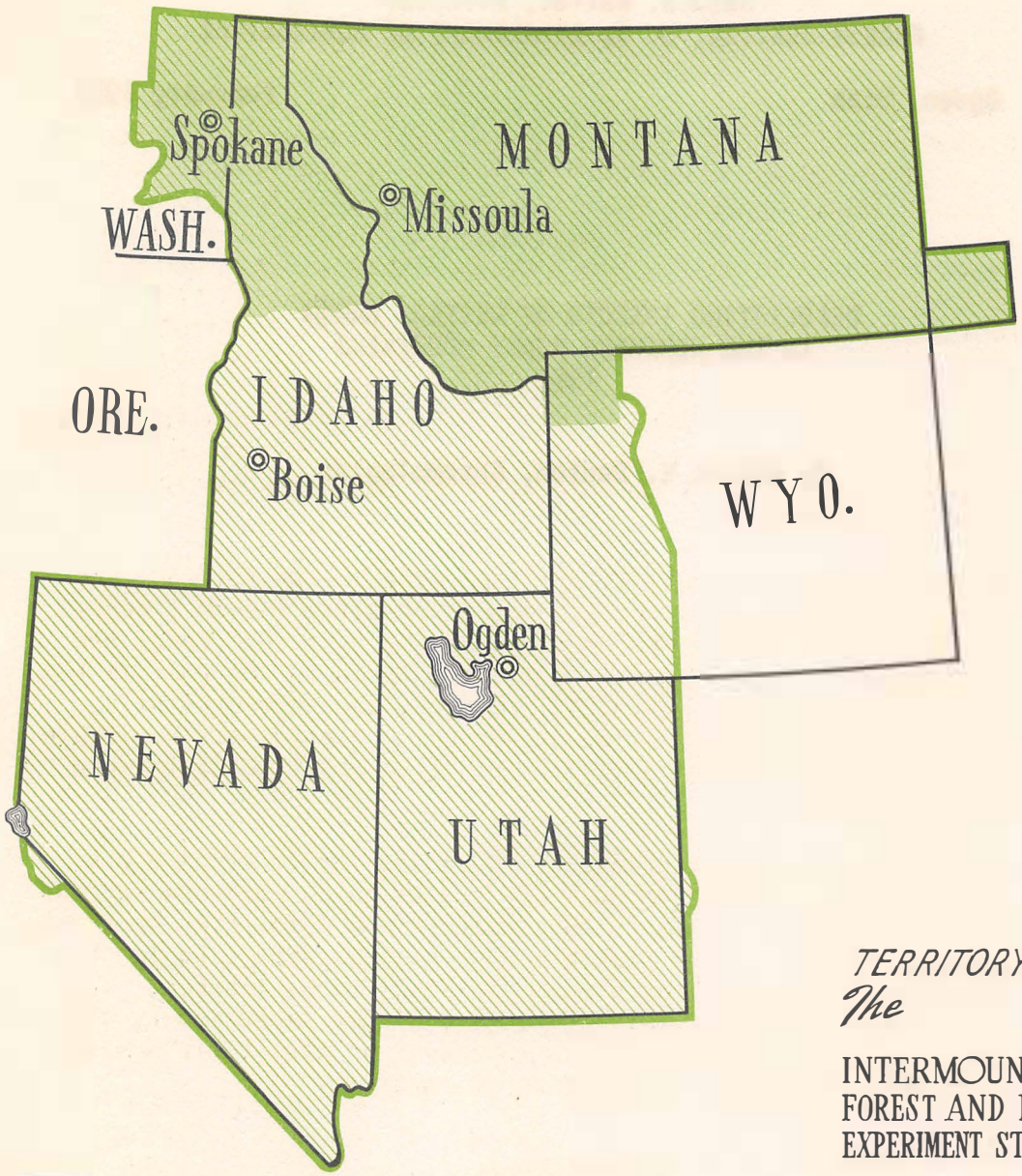

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INTERMOUNTAIN FOREST AND RANGE EXPERIMENT STATION

The MISSOULA FOREST INSECT LABORATORY is a field unit of the Intermountain Forest and Range Experiment Station at Ogden, Utah. The Laboratory conducts forest insect research, surveys forest insect outbreaks, and gives technical advice on cooperative insect control programs in Montana, northwestern South Dakota, northwestern Wyoming, northern Idaho, and northeastern Washington.

The functions are conducted in the remaining station territory by staff entomologists at Ogden, and Boise, Idaho.

DEFOLIATING INSECTS OF WESTERN LARCH IN THE NORTHERN ROCKY MOUNTAINS 1957

By Robert E. Denton, Entomologist

Western larch is host to several species of defoliating insects, a few of which are now cause for concern in the Inland Empire. Although larch is among the top ranking species in volume of timber logged in this region, comparatively little attention has been given to its defoliating enemies and no control measures have been developed for their suppression in western states. This may be attributed in part to a lack of any defoliator outbreaks of economic importance in this region, and partly to the fact that larch is much more resistant to the effects of defoliation than other coniferous trees. Whereas other conifers cannot replace foliage once it is lost, larch is capable of producing a second crop of needles during a growing season if the initial crop is destroyed.

Because larch is deciduous, and can replace lost foliage, the amount of damage caused by any one defoliating insect probably is minimized. This might account for the fact that there are no records of any mortality of western larch in the past as the result of defoliator activity. However, the only extensive insect outbreaks in this region for which records are available have been those of three species of larch sawflies during the 1920's and 1930's.

In 1955 concurrent outbreaks of three species of defoliators appeared in the northern Rockies, two of which were new records for this region. Again in 1957 another new defoliator outbreak was discovered. It is possible that serious damage to larch stands could result from a combination of these insects. Thus far, however, the several species are either separated by differences in types of larch stands infested, or else their numbers have not yet reached destructive proportions.

SURVEY METHODS

Late in the summer of 1955 scattered reports of defoliation in western larch stands were received from various forest personnel in the region. During the next year general examinations were made from the air and ground to determine the extent of the outbreaks and the several insects responsible.

In 1957 an increase in severity of existing infestations and the introduction of another new defoliator of larch into Idaho necessitated an expansion of the survey program to include more detailed information on defoliator conditions in western larch. Ground surveys showed four species of insects to be epidemic: the larch budmoth, larch casebearer, a "larch looper", and the two-lined larch sawfly. The infestations of each of these defoliators are described in this report.

Larch Budmoth

The larch budmoth (Zeiraphera griseana (Hbn.), Lepidoptera: Olethreutidae) is a small grayish-white insect with dark brown patches, and a wing expanse of $\frac{1}{2}$ to $\frac{3}{4}$ inch. It is a spring and early summer feeder in the larval stage, thus the reddish brown appearance of defoliated trees is visible by late July and early August. Although it is not the most widespread of the current larch defoliators, it caused the greatest amount of visible defoliation in 1957.

The present epidemic in the northern Rockies was observed first in 1955. In the ensuing two-year period the aggregate area of visible defoliation increased from some 33,000 to an estimated 250,000 acres. A distinctive characteristic of the outbreak is that budmoth populations were concentrated in mature larch stands that occur in patches along the summits of ridges and in headwaters of many drainages. Defoliation in these patches was visible during aerial examinations throughout the range of larch in northwestern Montana, northern Idaho, and northeastern Washington. Observers in some forests reported that no defoliation was noticeable below elevations of 4,200 feet. Above that level heavy feeding occurred up to elevations of over 6,000 feet.

Observations from the ground were difficult because the lower crowns of mature trees commonly are 60 feet or more above ground level. Examination of the foliage was accomplished by felling infested trees and visiting logging operations where larch was being cut. It was found that the distal half of the needles was destroyed in the majority of needle fasicles. The basal portion of the needles remained green and apparently were functioning since no attempt had been made by the tree to produce new foliage. In instances where the needles were destroyed for their entire length a second crop had appeared--although by the end of August the new growth measured only $\frac{1}{4}$ inch or less in length. From observations made in several localities it was estimated that budmoth feeding within the infested areas caused a reduction in the useable leaf surface of a tree of at least 50 percent in 1957.

Larch Casebearer

The larch casebearer (Coleophora laricella (Hbn.), Lepidoptera: Coleophoridae) is another defoliator that matures in the spring. It is a European insect which made its appearance in eastern United States in 1886. Since then it has spread westward through the range of American larch, or tamarack, as far as central Minnesota. The moth is silvery to grayish brown and has a wing expanse of 3/8 inch. Full grown larvae are about 3/16 inch in length.

The first appearance of the casebearer in western larch forests was recorded in 1957 when an outbreak extending over 15,000 acres was discovered in the vicinity of St. Maries, Idaho. The extent of the infestation together with the large size of its population suggests that the insect was introduced here several years prior to 1957.

Practically all of the mature larch within the above area has been logged. Present larch stands are comprised of reproduction- and sapling-size trees, occurring in small patches and in mixture with other conifers.

Heaviest casebearer populations were found in dense stands of reproduction, where the needles of practically every fascicle had been fed upon to some extent. Larvae were still actively feeding at the end of September, and the brownish discoloration of damaged foliage was very noticeable at that time. The amount of economic damage that has resulted remains unknown until further assessment can be made in 1958.

A Larch Looper

In 1957 a looper (Semiothisa sexmaculata (Pack.), Lepidoptera: Geometridae) was the most widespread defoliator of larch in the northern Rockies, although there are no records of its presence in this region prior to 1955. It was found in every western larch stand in Montana and Idaho where examinations were made--but always at lower elevations than the areas infested by the larch budmoth. With few exceptions looper populations were relatively small. Heavy infestations were encountered along the Blackfoot River northeast of Bonner, Montana, in the Swan Valley of the Flathead National Forest, Montana, and in a small area of the Kaniksu National Forest, Idaho.

Semiothisa larvae reach maturity in late summer and overwinter as pupae in the duff. Although the larvae are about one inch or more in length when fully grown, they are difficult to locate by casual observation since their color blends closely with that of the foliage. Some larvae were found to be brownish tan upon approaching

maturity but this color phase was determined to be the same species. The loopers are sensitive to being disturbed and readily drop on silken threads if a branch is shaken.

The amount of injury to the foliage was negligible except in the few heavily infested areas. Even here the visible effects of feeding were not apparent until September, only a few weeks before the natural shedding of foliage. Thus, it would seem that, by itself, Semiothisa sexmaculata does not present a serious menace to western larch.

Larch Sawflies

Three species of larch sawflies have been recorded in past epidemics in the northern Rockies. Two species, the two-lined larch sawfly (Anoplonyx occidens Ross, Hymenoptera: Tenthredinidae), and the western larch sawfly (Anoplonyx laricivorus Roh. and Midd.) were reported in epidemic numbers in 1921 and again in 1938. In each instance the outbreaks subsided the following year and neither insect was recorded again until 1955. It is peculiar that a 17-year interval exists between each of these records.

The larch sawfly (Pristiphora erichsonii (Htg.)) is the third species and is considered the most destructive. It appeared in this region in 1934 and in following years spread throughout the forests of western Montana and northern Idaho. Since 1944 it has not been seen again. No loss of timber resulted from any of these outbreaks.

During the past two years the two-lined larch sawfly and occasionally the western larch sawfly have been observed in association with the "larch looper" throughout the range of larch in this region. The amount of visible damage to the foliage as a result of their feeding appeared slight, as was that of the looper.

Control Recommendations

No methods of control have been developed against defoliating insects of western larch, although it is possible that the aerial spraying of some insecticides might prove effective. However, since little damage has resulted thus far from the several outbreaks no control measures are recommended at this time.